

CHAPTER V

SUMMARY

The beginnings of Magugu.--In 1943 a virulent outbreak of sleeping sickness in the Kiru-Magugu area of Tanganyika forced the Government to take drastic measures to protect the lives of the Africans living there. The complete evacuation of the area posed the problem of providing for these Africans land that was free of tsetse flies, the dreaded carriers of sleeping sickness. As a solution to this problem, a plan was devised to clear the vegetation from the northern, or Magugu, part of the area.

During 1944, 1945, and 1946 the clearings were completed and finally made Magugu an island of safety within the tsetse area. This tsetse-free status is preserved (1) by requiring all vehicles entering the area to go through cleansing sheds where they are sprayed so that no infected flies may enter the area, and (2) by keeping down the regeneration of vegetation within the area.

As a result of the evacuation of all Africans from Kiru, the Europeans living at Kiru were forced to abandon their fine estates, for without African labor they could not continue to operate. When the Government refused compensation for the evacuation some of these Europeans were financially ruined, while others have made a comeback near Magugu on the new Dudumera Estates.

Once the clearings and an irrigation ditch were completed, settlement began to take place. African farmers began tilling small plots of land and extending irrigation to their new fields. A trading settlement was set up, and shopkeepers and artisans were attracted to Magugu. A system of local Government was created with a Jumbe (headman), elders, policemen, messengers, and clerks. Marketing facilities in the form of a public auction started to function. A dispensary, jail, and baraza (public meeting house) were built. At the same time the present pattern of land use and adaptation to the environmental conditions began to evolve.

The physical background.--Magugu is located 4° south of the equator and 35° east of Greenwich in the bottom of the Rift Valley. Westward the massive Rift Wall towers three thousand feet above the valley floor, and eastward the Sangaiwe Ridge, a minor remnant of the eastern Rift Wall, borders the vast Masai Steppe. Southward the Dareda Ridge marks the southern extent of the interior drainage basin of Lake Manyara. To the north the valley slopes gently to the shores of Lake Manyara, twenty miles distant.

The topography of Magugu is nearly entirely flat, interrupted only by an occasional ridge of sand, an mbuga depression, or the remnants of the old pre-Rift peneplain, Sino and Besi hills. The valley in which Magugu is located is part of the lacustrine plain that has remained with the recession of Lake Manyara, an ancient saline lake.

Precise climatological information of Magugu is lacking, for there is no meteorological station maintaining comprehensive data in this part of the valley. Rainfall statistics are kept at Madukani, ten miles to the north. These statistics can be correlated with those that have been maintained at Dudumera, five miles to the south. They reveal an average yearly rainfall at Magugu of about twenty-eight inches. A dry season from June to October commonly receives no precipitation. April appears to be the wettest month and December the next wettest month. The most distressing feature of the Magugu rainfall regime is its unreliability. The short rains of January to March often fail with disastrous results, as this is the period when crops are normally maturing and need regular rainfall. Some years have rainfall under fifteen inches, while others have over forty, and there is no cycle or pattern which might allow the African to anticipate these variations.

Because Magugu is so close to the equator at an elevation of less than thirty-five hundred feet, it has year-round high temperatures. It never gets really cool, and in the summer temperatures of over 100° are common.

Little is known about the humidity, winds or insolation at Magugu, as no records are available. However, sensible humidity, i.e., how one feels, can be reckoned. The clamminess of eastern coastal areas is missing at Magugu. Even during the rainy season one is not oppressed

by the seeming closeness of the weather. Local winds are developed on a north-south axis because of the configurations of the Rift walls which run north-south. The moisture bearing winds from the southeast bring rain to Magugu in March and April, but the northwest monsoons, coming over the dry Masai Steppe, give Magugu its long dry June to October period.

The vegetation at Magugu has been radically altered by the clearance work of ten years ago. The predominant specie of tree was, and still is, the acacia. Today, as a result of the lack of moisture and the former clearings, most of the area contains a degraded type of xerophytic vegetation with the baobab trees outstanding remnants of pre-clearing days.

There are a wide variety of soils in Magugu. They are young soils derived from exposed lake bed and recent alluvial material, of which a high proportion is of volcanic origin. Nearly all these soils contain a high quantity of plant nutrients. Despite this, to the African, the agricultural potential varies considerably from one soil type to another, since the peasant farmer with his limited resources, is forced to take a soil as he finds it. He cannot alter drainage, topography, or climate, and these factors, as well as the purely chemical fertility of the soils, play an important part in the selection of land for settlement. Hence, such factors as heavy structure and salinity

have prevented the African, with his limited tools, from using fully the mbuga clays, even though they are potentially some of the best soils of the region. Conversely the loose sands, basically the least fertile soils of the area, are intensively cultivated, for they appear on high lying, well drained ridges and are easily worked by hand.

Land use.--Not only have such physical factors as soils, climate and topography affected the land use pattern, but also the various origins of the fifty-five tribes at Magugu have influenced how these people farm. Hence, tribes from the more humid areas of the Territory have brought to Magugu their rice-raising techniques. Similarly other tribes from the drier parts of Tanganyika have been the big cattle and millet raisers.

The religion of the people has also influenced the land use pattern. Moslem and pagan farmers with more than one wife have been able to expand their acreages, while a Christian is restricted to what he and one wife can cultivate.

During the past ten years various methods of herding and grazing livestock have been developed. As cooperative herding is common, many owners are represented in a single cooperative herd. Certain areas, such as mbugas, are set aside for dry season grazing, but livestock pressure has become so great that there is no longer enough grass to maintain the herds in good flesh during the dry

season. Unless herds are curtailed or methods devised to provide feed during the dry period, the livestock problem will become increasingly severe.

A wide variety of reasons influences the farmer's choice of his farm. A high percentage of Africans when choosing land at Magugu is concerned with soil characteristics. For others, concerned with being near friends, relatives or fellow tribesmen, soils take a secondary role. A few are interested in getting farms near grazing lands, near the Magugu trading settlement, or near the Great North Road. Some purchase their farms, but still very few farms are bought or sold, and this situation will probably continue as long as there is ample free land available.

The average size of the cultivated holding of Magugu farmers is small. It is only 2.53 acres, which on the average represents $3\frac{1}{2}$ fields per farm with an average field size of 0.71 acres. The concept of ownership of farms is not well defined in the community. Although officials use the criterion that the farmer owns "as much as is cultivated", in this case an average of 2.53 acres, the African often feels his ownership includes areas of non-cultivated land as well. Though ownership boundaries are ill-defined, a system of inheritance has grown up in order to pass on land holdings to heirs.

The main crops raised at Magugu are millet, corn and rice, in that order. Although millet is strictly a

non-irrigated crop, and corn nearly so, all rice is irrigated. There are more fields of corn than any other single crop, a reflection of its common use as a human food by the African. Millet, with fewer fields than corn, commands the largest acreage of any crop, and the fields have an average size larger than any other crop. This can be attributed to the low yields and to the minimum amount of labor needed to cultivate millet. Rice also has fields of large size, a reflection of the fact that nearly the same amount of work is needed to prepare a small paddy for production as a large one.

The great cash crop of the Magugu farmer is the castor bean. Next to corn there are more fields planted to castor beans than any other crop. However, the size of these fields is very small, averaging only 0.3 acres per field as against, for example, 1.63 acres for millet and 1.36 for rice. As castor beans require practically no care and are drought resistant, they are popular with the African. The main drawbacks to the cultivation of castor beans are wide price fluctuations and their deleterious effect upon soils.

Cassava, sweet potatoes, peanuts, sugar cane, fruit, and a number of miscellaneous crops are grown at Magugu, but on exceedingly small plots. They are all used to supplement the drab diet of the African and play only a small part in the agricultural commerce of the area.

Wild game damage.--The main crop damage at Magugu from wild life occurs when large flocks of birds rob the rice and millet fields. Because of this, many man-days of labor are spent merely guarding crops until they can be harvested. More spectacular damage to crops is done by such large animals as elephant, rhinoceros and buffalo, but the smaller species such as dik diks, wild pigs, porcupines, monkeys and baboons cause much greater damage than do the larger animals. Because of the ever present danger from wild animals the Government maintains game scouts in the Rift Valley to keep down the numbers of certain species.

The Magugu market.--Most agricultural products of the area are sold at a Government-supervised auction held periodically in Magugu. Only licensed buyers may purchase at the auction, and this restriction limits the buyers to a few local Asian traders. The two main items bought and sold are castor beans and unhulled rice, but a wide variety of other items ranging from wild honey to onions are handled.

Income.--The African at Magugu estimates his yearly income to be Shs. 204/- (\$28.63), but by ascertaining all his various sources of income it was found that Shs. 250/98 (\$35.13) represents his average income. Labor on nearby European estates still represents the largest single source of this income, but percentagewise this figure is shrinking as Magugu becomes more populated. The sale of handicrafts contributes the second largest portion of income, followed

closely by the sale of castor beans. Such other varied sources as the wages of Government officials, prostitution, the sale of rice, onions, livestock, beans and other crops all contribute to the cash income pattern.

Outside influences.--Such outside influences as the nearby European estates, the Government and its officials, and the Great North Road have left their imprint upon the community and continue to shape and influence its destiny.

CONCLUSIONS

Although Magugu has progressed greatly in the ten years it has been in existence, it still has far to go before it reaches maturity. If Magugu is to realize its full agricultural potential, a number of problems must be solved.

More must be known about its climate. There is no meteorological station at Magugu, and the only climatic data available are rainfall statistics from a station in the Rift Valley located ten miles from Magugu. Because of the unusual configurations of the Rift Wall which cause small pocket valleys within the greater Rift Valley, climatological differences along the base of the Rift Wall vary greatly in a distance of a few miles. The problem of determining the microclimatological aspects of the Rift Valley can be met only by a series of meteorological stations which take into consideration the many local differences to be found

in the Valley. Until these stations are set up, it will be impossible to determine the type of climax agricultural use to which the area should prepare to adapt itself.

Although this study revealed for the first time a basic knowledge of the soils of Magugu, more must be learned before proper recommendations can be made as to what crops could best utilize these soils. The existence of a hardpan layer is known, but its areal extent has not been fully mapped. Certain trace mineral problems, as they apply to specific plants, are unknown, and their discovery awaits leaf studies of affected plants. Proper methods of handling difficult soils so that the Africans can utilize them must also be investigated.

The greatest single retardment to the present expansion of the area is the lack of water for irrigation. The problems of maintaining the present irrigation ditch, of building new ditches for the expansion that is slowly taking place, and of fairly allocating the water must be met soon. Water no longer flows the full length of the irrigation ditch. As more water is drawn off near the source of the ditch, and as further deterioration in the ditch takes place, many farmers will be cut off from their water supplies. When, and if, this happens, economic power will become concentrated in a smaller and smaller group of favored water users, who, if allowed to maintain their positions, could seriously hinder the expansion of the whole area. Care must be exercised that this does not happen.

Along with water for irrigation there is the problem of providing uncontaminated water for human use. The present supply comes entirely from the irrigation ditch or from open ponds or drainage ditches. These waters are infected with bilharzia and other dangerous parasites and are used not only for drinking but also for bathing, washing clothes, cooking, and as a latrine. The supplying of uncontaminated water will be a difficult problem. Test wells dug by neighboring European farmers are often saline. To the north the Catholic mission has had a number of wells go dry over a period of forty-five years. However, no deep bore wells have been dug in this area, and until this possibility is explored, it will not be known whether or not deep bore wells will prove feasible.¹ Another possibility is the damming of one of the streams coming from the western Rift Wall. One Government plan envisages a dam on a tributary of the Dudumera River where enough water is available not only for irrigation and personal use but also to generate electricity for a large area. However, this project would require large sums of money which at present are not forthcoming. Until capital is available for adequate water works, the problem of pure water will continue to be a pressing one.

Allied with the problem of pure water is the need for

¹The Mbugwe Mission is about to drill a deep well with funds provided by American friends. The results of this effort will be known soon.

a general improvement in health conditions. Though an African dispensary exists at Magugu, its facilities are inadequate. Bed space is so limited that many patients sleep outside or in makeshift quarters, or are refused admission entirely. No qualified doctor serves the Magugu community. The nearest physician is over thirty miles away, and because of inadequate transportation available to the African such needed medical assistance as emergency operations are denied him. Along with better modern medicine there is a great need for health and hygiene education among the African. Often he does not realize what is causing his illness, nor does he know even simple methods of prevention or cure. For example, the boiling of all water would prevent many of the ailments the African is heir to, yet he has not been impressed with the necessity of this procedure. Because of his poor medical facilities and his lack of knowledge of basic health rules the African at Magugu is often ill, and this illness in turn affects his working ability and his whole economic output and hinders the realization of Magugu's potential development. Widespread publicity and education will help to make the African aware of how to cope best with his many health problems.

Education in general is still lacking to most Magugu farmers. A start has been made with the opening of Magugu's first school in 1954. However, this school teaches a child for only two years, and if a child is to receive further education it must leave the Magugu community. Illiteracy is

high, and if the many problems of economic development that are associated with lack of education are to be met, the Government must expand the educational base. This expansion would include adult education and the addition of instructors in such fields as agriculture, mechanics and industrial arts, handicrafts, sewing, and cooking. This, of necessity, would be a slow and long range program due to the necessity of first training qualified African teachers and the necessity of breaking down many prejudices against education including the education of women.

There is a need for providing better seeds to the Magugu farmers. A beginning has been made in improving the rice seed of Magugu with the creation of Government rice seedling plots in 1954. However, the important corn crop still depends upon seed stock that has not been changed for a long time. Hybrid corn, for example, is unknown at Magugu. The blight that has been spreading through cassava continues to lower the yields of this important food crop. Unless careful plant breeding produces new blight-free varieties of cassava, this plant may eventually disappear from the area. The yields of millet remain low, even though new varieties raised by Europeans on the adjacent Dudumera Estates have much higher yields than that raised at Magugu. Many of the seed deficiencies of Magugu could be overcome by providing already proven seeds, such as new millet or hybrid corn, to the farmers.

The livestock problem remains a pressing one. Present breeds of cattle are of poor quality and produce little milk. As a result, cattle that are sold bring low prices, and those kept by the Africans sometimes do not justify the grass they consume. The introduction of controlled grazing, hay making, and herd culling would help keep the animals in good flesh during the long dry season. However, as cattle are primarily a prestige item whose value depends more upon such characteristics as color or size of horns than upon quality, it will take a long period of education to convince the African of the desirability of improving his breed stock. As the African prizes milk, butter, and ghee in his diet, it should be an easier task to convince him of the necessity to improve the milk strain in his cattle than it would be to improve the beef strain. The inbreeding of improved dairy strains with the present basic stock, though fraught with the dangers to disease and climate that such a move involves, would do much to improve the diet of the farmer.

The problem of the tsetse fly, and the scourge of sleeping sickness that it carries, is a continuing one. Only by the vigilance of the people in clearing regenerating bush can this pest be held in check. At certain times regeneration reaches such proportions that the community is seriously endangered, and certainly there is a need for an organized and orderly yearly program of bush clearance. The answer to the tsetse problem may lie in increased European alienation of

land on Magugu's perimeters. It may lie in encouraging further African settlement in this fertile valley. Whatever the solution, the welfare of the African must be kept paramount, and if in furthering that welfare the European too may benefit, then all the better.

Transportation facilities must be improved if the produce of an expanding Magugu is to reach outside markets. Local roads, now largely neglected, need adequate and periodic maintenance. If an expansion of commercial crop acreage is to occur, first priority must be given to adequate highways. A modern communication system is also badly needed. The telephone and telegraph, if introduced, would lessen Magugu's isolation and permit better business practices, would aid in law enforcement, and would enable outside medical assistance to be called in emergencies. But good roads, adequate communications, and such western-considered necessities as electricity, are still goals of the future, in many instances of the unforeseeable future. Most of these improvements must depend upon appropriations from the Government, and in an undeveloped Territory like Tanganyika the money is not available today.

The problems involved in welding a diverse people of fifty-five tribes into a community such as Magugu are complex. Yet Magugu is proof that it can be done with a minimum of friction. The important thing to realize is that here in the Rift Valley a stand has been taken against the spread of

sleeping sickness. Because of this stand an important contribution is being made towards feeding the people of Tanganyika, who in modern times have had to depend upon outside sources for some of their food. The valley has a great economic potential, and Magugu has pointed the way towards achieving this potential.

The question is often raised as to whether or not a resettlement scheme such as Magugu justifies the funds spent. In terms of money, it has amply repaid the initial investment. Without the clearance scheme, long-term relief would have had to be provided to many Africans now living at Magugu; more food would have had to be imported; less taxes would have been paid; cattle could not be driven to market on the Great North Road; the Wambugwe to the north would have long since been invaded by the fly as would also large areas to the south. It is difficult to add up the monetary value of many of these benefits. In the case of Magugu the question of the value of such schemes is answered by a happy population of Africans, who, but for the Magugu clearance, might be a landless people. Happiness and freedom and the saving of life itself can hardly be measured in money.